

REMARKS

Claims 1-19 have been examined. Claim 2 has been canceled without prejudice or disclaimer. Applicant reserves the right to pursue this claim in a divisional or continuation application.

Objections to the Claims

Claim 1 is objected to for missing a transition term (e.g., "comprising"). Also, claim 12 is objected to because the equations therein contain identical symbols on both sides of the equations. For example, $L = 0.7*L + 0.3*Ls$. The Examiner also indicates that claim 15 is objected to because the limitation "the signal (sound)" lacks sufficient antecedent basis.

Applicant respectfully requests the Examiner to withdraw the objections in view of the self-explanatory claim amendments made herein.

In addition, equations 3 and 6 in paragraph 42 of the specification are also amended to be consistent with the changes to claim 12.

Objections to the Specification

The Examiner objects to the specification and notes that on page 12, equation 3 has identical symbol (L) on both sides of the equation. In view of the Objections to the Claims, Applicant respectfully requests the Examiner to withdraw the objections in view of the self-explanatory amendments to the specification made herein.

Rejection under 35 U.S.C. § 102

Claims 1-2, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Asakura et al. (US 6,681,018, hereinafter, "Asakura").

Claim 1 has been amended to incorporate the features of claim 2. In particular, amended claim 1 recites, inter alia

reproducing sound output through a plurality of additional channels in a multi-channel stereophonic sound system by using a signal of a left stereo channel, a signal of a right stereo channel, and a signal of a center channel,

wherein the multi-channel stereophonic sound system is a 5.1-channel stereophonic sound system and the plurality of additional channels use speakers of a TV set or a stereo audio system.

With regard to claim 2, the Examiner asserts that column 5, lines 48-50 discloses the claimed plurality of additional channels use speakers of a TV set or a stereo audio system. However, column 5, lines 48-50, of Asakura merely disclose a 5.1 channel system without any relationship to the headphones 8 that the Examiner asserts discloses the “plurality of additional channels.” That is, headphones 8 is not a component of the 5.1-channel stereophonic sound system, as claim 1 would require. Furthermore, Asakura fails to disclose using speakers of a TV set. It appears the Examiner may be broadly interpreting the headphones 8 of Asakura as a stereo audio system. However, as noted above, headphone 8 of Asakura is not equivalent to a plurality of additional channels in a multi-channel stereophonic sound system. Therefore, claim 1 is patentable for at least this reason.

In addition, claim 1 recites, inter alia:

the output of a left additional channel is produced using the signal of the left stereo channel and the signal of the center channel, and excludes using the signal of the right stereo channel and a signal of a right surround channel, and

the output of a right additional channel is produced using the signal of the right stereo channel and the signal of the center channel, and excludes using the signal of the left stereo channel and a signal of a left surround channel.

Asakura fails to disclose these features of claim 1. Therefore, claim 1 should be patentable at least for this reason.

In addition, claim 19 should be patentable at least by virtue of its dependency upon claim 1.

Rejection under 35 U.S.C. § 103

Claims 3-9, 10-11, 13-14, and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (hereinafter, "APA") in view of Cohen et al. (U.S. Pub. No. 2003/0031333, hereinafter, "Cohen").

The Examiner indicates that the alleged APA does not teach or suggest producing the signals of the left stereo channel and the right stereo channel based on the positions of speakers of the left and right stereo channels. Thus, the Examiner cites to Cohen to correct this deficiency. The Examiner also notes that claim 15 does not exclude the presence of left surround signals and right surround signals from the production of the output of the left speaker of the TV set and the output of the right speaker of the TV set.

A. Claim 15

Claim 15, as amended, recites:

a TV speaker output producer that produces an output of a left speaker of a TV set and an output of a right speaker of the TV set using the signal (sound) of the left stereo channel, the signal (sound) of the right stereo channel and the signal (sound) of the center channel produced by the multi-channel sound producer; and

a multi-channel TV speaker output producer that produces the signals of the left stereo channel and the right stereo channel based on the positions of speakers of the left and right stereo channels,

wherein the output of the left speaker of the TV set is produced using the signal (sound) of the left stereo channel and the signal (sound) of the center

channel, and excludes using the signal (sound) of the left surround channel and the signal (sound) of the right surround channel; and

the output of the right speaker of the TV set is produced using the signal (sound) of the right stereo channel and the signal (sound) of the center channel, and excludes using the signal (sound) of the right surround channel and the signal (sound) of the left surround channel.

The Examiner appears to acknowledge that the alleged APA fails to teach or suggest excluding the presence of left surround signals and right surround signals for producing the output of the left speaker of the TV set and the output of the right speaker of the TV set. Therefore, Applicants submit that the alleged APA fails to teach that the output of the left speaker of the TV set is produced using the signal (sound) of the left stereo channel and the signal (sound) of the center channel, and excludes using the signal (sound) of the left surround channel and the signal (sound) of the right surround channel; and the output of the right speaker of the TV set is produced using the signal (sound) of the right stereo channel and the signal (sound) of the center channel, and excludes using the signal (sound) of the right surround channel and the signal (sound) of the left surround channel.

Furthermore, Cohen fails to correct the deficiency of the alleged APA. For example, Cohen merely teaches determining the location of each speaker relative to a listening place within said space determined by the placement of a sensor and a means for manipulating each sound track of the multi-channel sound signals with respect to intensity, phase and/or equalization, according to the relative location of each speaker (paragraphs 11-13). That is, Cohen merely teaches that a listener sweet spot is selected according to a position of a remote position sensor 27 and manipulates the output of each speaker of the five speaker system in accordance with the speaker's position relative to the sweet spot (i.e., the sensor 27)

(paragraphs 13, 46 and 56). Cohen, however, does not teach or suggest that the output of the left speaker of the TV set is produced using the signal (sound) of the left stereo channel and the signal (sound) of the center channel, and excludes using a signal (sound) of the left surround channel and a signal (sound) of the right surround channel; and the output of the right speaker of the TV set is produced using the signal (sound) of the right stereo channel and the signal (sound) of the center channel, and excludes using the signal (sound) of the right surround channel and the signal (sound) of the left surround channel, as recited in claim 15.

Therefore, the alleged APA, alone or in combination with Cohen, fails to teach or suggest each and every feature of claim 15. Claim 15 should be patentable for at least this reason.

B. Claim 16

The Examiner also asserts that Cohen teaches the features of claim 16. Claim 16, as amended, recites:

increases output (sound) components of the left stereo channel contained in the output of the left speaker of the TV set and decreases output (sound) components of the center channel contained in the output of the left speaker of the TV set, each directly corresponding to a decrease in a distance between the left speaker of the TV set and the left stereo channel, and the output of the left speaker of the TV set is smaller than the output of the left stereo channel; and

increases output (sound) components of the right stereo channel contained in the output of the right speaker of the TV set and decreases output (sound) components of the center channel contained in the output of the left speaker of the TV set, each directly corresponding to a decrease in a distance between the right speaker of the TV set and right left stereo channel, and the output of the right speaker of the TV set is smaller than the output (sound) of the right stereo channel.

In particular, the Examiner asserts that paragraphs 12 and 56 teach the above features. However, Cohen merely teaches determining the location of each speaker relative to a listening place within said space determined by the placement of a sensor and a means for manipulating each sound track of the multi-channel sound signals with respect to intensity, phase and/or equalization, according to the relative location of each speaker (paragraphs 11-13). In other words, Cohen merely teaches that a listener sweet spot is selected according to a position of a remote position sensor 27 and manipulates the output of each speaker of the five speaker system in accordance with the speaker's position relative to the sweet spot (i.e., the sensor 27) (paragraphs 13, 46 and 56). Cohen, however, does not teach or suggest increasing output (sound) components of the left stereo channel contained in the output of the left speaker of the TV set and decreasing output (sound) components of the center channel contained in the output of the left speaker of the TV set, each directly corresponding to a decrease in a distance between the left speaker of the TV set and the left stereo channel. Cohen merely teaches manipulating the speakers of the five speaker system (see paragraph 39) according to each speaker's location in reference to a listener "sweet spot." Cohen makes no mention of how to manipulate the speakers of a left speaker of a TV set or a right speaker of TV set. Furthermore, Cohen does not teach or suggest manipulating the output of a TV speaker according to a distance (position) between a speaker of a TV set and a speaker of a stereo channel. That is, the manipulation of a stereo speaker in accordance with a position with a listener sweet spot is not equivalent to increasing output (sound) components of the left stereo channel contained in the output of the left speaker of the TV set and decreasing output (sound) components of the center channel contained in the output of the left speaker of the TV set, each directly corresponding to a decrease in a distance between the left speaker of the TV set and the left stereo channel.

Also, Cohen teaches that the processor 35 manipulates each sound track according to the measurement results, using HRTF parameters (paragraph 12 and 56). The measurement results taught in Cohen merely correspond to the location of a multi-channel speaker with respect to a remote positioning sensor 27 (i.e., a listening place). For example, Cohen teaches that HRTF is used to calculate sound heard at the listener's ears (i.e., at the listener sweet spot) relative to the spatial coordinates of the sounds origin (i.e., from the speaker) (paragraph 3). Thus, Cohen merely teaches manipulating the output of a stereo speaker according to the position of the listener. HRTF does not correlate into manipulating an output of a TV speaker in accordance with its position relative to a stereo channel. Thus, Cohen does not teach or suggest producing the output of TV speakers directly corresponding to a decrease in a distance between the left speaker of the TV set and the left stereo channel or a distance between the right speaker of the TV set and right left stereo channel. Also, Cohen fails to make any mention of increasing and decreasing stereo channel components of TV speakers altogether, as recited in claim 16. The Examiner's broad and unsupported assertion that paragraphs 12 and 56 of Cohen teaches these features is insufficient for supporting the rejection. Therefore, claim 16 should be patentable for at least these reasons.

C. Claim 17

Claim 17, as amended, recites:

wherein the TV speaker output producer produces the output (Ltv) of the left speaker of the TV set using one of equations 1 and 2 and the output (Rtv) of the right speaker of the TV set using one of equations 3 and 4:

$$Ltv = 0.7 * \{a * L + (1 - a) * C\} \quad \dots (1)$$

$$Ltv = 0.7 * \{(0.3 + a) * L + (1 - a) * C\} \quad \dots (2)$$

$$Rtv = 0.7 * \{a * R + (1 - a) * C\} \quad \dots (3)$$

$$R_{TV} = 0.7 * \{(0.3 + a) * R + (1 - a) * C\} \quad \dots(4)$$

wherein, L, R, and C represent the signal output from the left stereo channel, the signal output from the right stereo channel, and the signal output from the center channel, respectively, and “a” is a constant that is obtained by dividing a distance between the right speaker of the TV set and the right stereo channel by the sum of a distance between the right speaker of the TV set and the right stereo channel and a distance between the right speaker of the TV set and the center channel.

The Examiner asserts that paragraphs 12 and 56 of Cohen teach the above features.

However, claim 17 should be patentable for reasons similar to those presented above in conjunction with claim 16. In particular, the Examiner’s broad and unsupported assertion that paragraphs 12 and 56 of Cohen teaches these features is insufficient for supporting the rejection. Cohen offers no teaching or suggestion for producing TV speaker outputs according to the features recited in claim 17. The mere manipulation of multi-channel stereo outputs is not the equivalent of producing the output of the left speaker of a TV set and the right speaker of a TV set according to the features recited in claim 17. Moreover, Cohen offers no teaching that the outputs of the multi-channel speakers are manipulated according to anything other than an individual speaker’s placement according to a listening position. There is no mention that an output of a multi-channel speaker is manipulated according to the signal output of other multi-channel speakers. Thus, the alleged APA, alone or in combination with Cohen, fails to teach or suggest each and every feature of claim 17.

D. Claim 18

Applicant submits that claim 18 is patentable at least by virtue of its dependency upon claim 15.

E. Claims 3-9, 10-11 and 13-14

The Examiner asserts that claims 3-9, 10-11 and 13-14 are similar to claims 15-18 and “essentially” have the same scope and content for reproducing multi-channel stereophonic sound similar to apparatus claims 15-18. Applicant disagrees with the Examiner’s assessment. For example, at least claims 5, 6, 7, 8, 11 and 13 contain patentable features which are not necessarily covered by the scope of original claims 15-18. Therefore, Applicant requests the Examiner to consider the features of the claims in their entirety with respect to the cited art, or else deem the claims allowable.

In addition, claims 3-9, 10-11 and 13-14 include analogous, though not necessarily coextensive features in conjunction with claims 15-18, and therefore, claims 3-9, 10-11 and 13-14 are patentable at least for the reasons discussed for claims 15-18.

F. Claim 12

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over the APA in view of Cohen, and further in view of Endoh et al. (US 6,016,295, hereinafter, Endoh). Endoh, however, fails to correct the deficiencies of the alleged APA and Cohen in view of claim 10 presented above. Therefore, claim 12 should be patentable at least by virtue of its dependency upon claim 10.

In addition, claim 12 recites:

the output L' of the left stereo channel and the output R-R' of the right stereo channel are calculated using the equations below:

$$\underline{L'} = 0.7*L + 0.3*L_s$$

$$\underline{R'} = 0.7*R + 0.3*R_s$$

wherein, L_s and R_s represent the signals output from the left surround channel and the right surround channel, respectively, and wherein L and R represent the output (signal) from the left stereo channel and the output (signal) from the right stereo channel, respectively.

The Examiner acknowledges that neither the alleged APA or Cohen teaches the above equations and cites to Endoh for correcting this deficiency. In particular, the Examiner asserts that Endoh teaches a method for reproducing audio signals (col. 3, lines 4-6) in which the left output channel L_o and right output channel will output the following in col. 36, lines 15-25:

$$L_o = L + 0.7 * C + 0.7 * L_s$$

$$R_o = R + 0.7 * C + 0.7 * R_s$$

In addition, the Examiner asserts that claim 12 does not exclude the presence of a center channel.

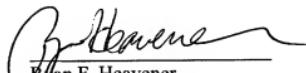
It is clear from comparing the equations of Endoh with the equations of claim 12, that the equations of Endoh do not read on the equations of claim 12. Furthermore, Endoh provides no teaching or suggestion to adjust the equations in accordance with those recited in claim 2. Also, it is inherent from the equations recited in claim 12 that a center channel component is excluded. Therefore, claim 12 should be patentable for at least these additional reasons.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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